of these diseases. This may possibly be found in fungicides used in the houses, before the plants are started or by their application to the soil and growing crops while in a young state.

AMHERST AGRICULTURAL COLLEGE, AMHERST, MASS.

TREATMENT OF CRANBERRY SCALD AND CRANBERRY GALL-FUNGUS.

BY BYRON D. HALSTED.

It has been determined by a thorough canvass that a large fraction of the cranberry crop is destroyed by the scald, sometimes called "rot." The loss sometimes reaches as high as 65 per cent., and in many places it has rendered the growing of cranberries a profitless industry.

A fungus is closely associated with this scald, and in no case has a soft berry been examined microscopically without the same fungus being present. The leaves, vines, and roots also of the plants bearing scalded berries, abound in the same fungus. In general structure, habits, and behavior, the fungus of the cranberry scald is closely related to the one causing the black-rot of the grape. As yet no fungicides have been tested upon the scald, but from its relationship to the black-rot of the grape it is only reasonable to infer that the same treatment might be efficacious. In view of the fact that the cranberry has small smooth thick leaves it is possible that the mixtures employed for the grape could be used with greater strength upon the former. However, a beginning can be made with the ammoniacal copper carbonate solution, directions for the preparation of which will be found elsewhere in this JOURNAL. The amount of this solution to be applied per acre can not be stated because it will vary with the rankness of the vines. Apply for the first time as soon as the spring flooding is past, and again just before the blossoms unfold. The third application should be in midsummer, followed by two others at intervals of two weeks. This makes five sprayings in all. The instruments to be used will depend much upon circumstances. If the owner applies Paris green or London purple for the insect enemies of the cranberry, namely, the tip worm, vine worm, etc., then the remedy for the scald can be applied with the same pump.

There is much to be done in improving the *sanitary* conditions, if that term may be used, of the bogs. It is important to have perfect control of the water supply, and during the growing season, while keeping the bog moist enough for the plants, have the ditches deep and free-flowing that stagnant water can be kept from the roots of the plants. Doubtless much depends upon having the soil of the bog in the best condition for the healthy growth of the plants. Where the peat is sour and soaked with standing water the best conditions obtain for the scald. It may be that proper drainage, water control, and

sanding will bring the necessary conditions for healthy plants, and the old plants may outgrow the trouble with the aid, in the meantime, of the remedy proposed. The best thing to do will be to try and see, upon a small area, provided the practical pecuniary test of possible profit prompts the owner. Some bogs are so poorly adapted for this peculiar industry that it will not pay to spend money upon them, others, nevertheless, merit much more attention than they receive.

THE GALL-FUNGUS.

This appears to be confined to a single bog in New Jersey, but in that one it is disastrous. Several closely related shore plants as azalea, sheep laurel, lambkill, white alder, leather leaf, huckleberry, and tea berry or winter green, are attacked by the same fungus (*Synchytrium Vaccinii*, Thomas). The disease is spread by the water in the spring floods and does not pass readily through the air. There is some danger, however, of the pest spreading to other bogs and therefore if this bog was destroyed by fire, together with the infested shore plants there might be hope for a speedy end to the trouble. The matter is so local that it does not merit further treatment here.

The two diseases of the cranberry herein briefly treated are considered at length, with several engravings, in Bulletin 64 of the New Jersey Experiment Station.

RUTGERS COLLEGE, NEW BRUNSWICK, N. J.

TREATMENT OF APPLE SCAB.

BY E. S. GOFF.

Recent experiments indicate that apple scab (*Fusicladium dendriticum*, Fckl.) may be almost entirely prevented by the application of certain liquid preparations, in the form of a spray, that, while harmless to the foliage and fruit of the tree, are destructive to the fungus which causes the disease. Various substances have been found to be more or less beneficial, but at the present state of our knowledge, a solution of copper carbonate in ammonia largely diluted with water is to be most strongly recommended. Experiments conducted, the past season, in the orchard of Mr. A. L. Hatch, of Ithaca, Wis., with this preparation proved so far satisfactory that Mr. Hatch has decided to apply the treatment to his entire orchard of about 25 acres the coming season, as a means of increasing the income from his apple trees.

DIRECTIONS FOR PREPARING AND APPLYING THIS FUNGICIDE.

The copper carbonate and the ammonia may be procured through almost any retail druggist. As the former is not always kept in stock it would be well to order it some days before it is desired for use. The